



# MARSHALL STAR

Serving the Marshall Space Flight Center Community

July 15, 2010

## ET-138 delivered in style

## NASA ceremony honors shuttle external tank work force



ET-138 begins its rollout to the Michoud harbor.

By Sanda Martel

NASA and Lockheed Martin Space Systems Company paid tribute to the work force who built the external tanks for the space shuttle fleet at NASA's Michoud Assembly Facility in New Orleans July 8.

As many as 1,000 current and former employees who had a part in the 37 years of work on the tank gathered to celebrate the delivery of the last production tank, ET-138. In a New Orleans-style ceremony, complete with a traditional brass band, handkerchief-waving employees escorted the tank on its rollout to Michoud Harbor. Later in the day, it departed Michoud aboard the Pegasus barge, towed by two tugs to the Port of Gulfport where the Freedom Star, NASA's solid rocket

See ET-138 on page 5

## NASA tests engine technology to assist with future space vehicle landings

By Kim Newton

Spacecraft attempting to land on an unfamiliar surface need to perform a maneuver called "deep throttling" — a step that allows the vehicle to precisely throttle down to perform a smooth, controlled landing. NASA, in partnership with Pratt & Whitney Rocketdyne of Canoga Park, Calif., has demonstrated this type of engine control capability to help design a more reliable and robust descent engine that could be used to land space exploration vehicles on the moon, an asteroid or another planet.

The Common Extensible Cryogenic Engine, also known as CECE, recently completed the fourth and final series of hot-fire tests on a 15,000-pound thrust class cryogenic technology demonstrator rocket engine, increasing the throttling capability by 35 percent over previous tests. This test series demonstrated this engine could go from a thrust range of 104 percent power down to 5.9 percent. This equates to an unprecedented 17.6:1 deep-throttling capability, which means this cryogenic engine can throttle up and back down quickly.

See Engine on page 6

## Crew visit July 15

Space shuttle astronauts who flew the STS-132 mission in May will visit the Marshall Space Flight Center on July 15 to provide highlights of their 12-day mission to the International Space Station. They launched aboard shuttle Atlantis from NASA's Kennedy Space Center, Fla., May 14 and returned May 26. The astronauts delivered a Russian Mini Research Module, a set of batteries for the space station's truss, a high-powered dish antenna assembly and other replacement parts to the orbiting outpost. Their presentation in Morris Auditorium will begin at 10:15 a.m.

# Schumacher reassigned to manager of Science & Mission Systems

## *Bobby Watkins reassigned to director of Office of Strategic Analysis & Communications*

Dr. Dan Schumacher is reassigned from the position of director of the Office of Strategic Analysis & Communications to the position of manager of the Science & Mission Systems Office at the Marshall Space Flight Center. Bobby Watkins, current chief of staff at Johnson Space Center in Houston, is reassigned to the position of director of the Office of Strategic Analysis and Communications.

In his new role, Schumacher will direct S&MS, which develops, operates and executes NASA programs, projects and activities that fall at the intersection of science and exploration. Just a few of the missions falling under the purview of the office are SERVIR, Dawn, Messenger, New Horizons, Hinode, and the Chandra and James Webb Space telescopes. The office is also responsible for the Environmental Control and Life Support System and Multi-Purpose Logistic Modules for the International Space Station.

Schumacher has served as strategic analysis and communications director since 2008. His early career was as a systems engineer with U.S. Air Force and Army acquisition programs, with most of that time focused on development of missile defense systems.

Schumacher joined NASA in 2001 in Marshall's Second Generation Reusable Launch Vehicle Program Office. He later served as manager of Systems Engineering, Integration and Test for the X-37 Project Office at Marshall. In 2005, he completed a one-year assignment at NASA Headquarters within the Office of the Chief Engineer, where his duties included serving on the Nunn-McCurdy Review of the National Polar Orbiting Environmental Satellite System.

Prior to assuming the strategic analysis and communications directorship, Schumacher was deputy project manager of the Lunar Lander Project Office at Marshall, where he led early design of hardware and integrated systems that would enable human crews to land on the moon. He earned a bachelor's degree in industrial engineering from Texas A&M University in College Station and received his master's and doctorate degrees in systems engineering from the University of Alabama in Huntsville.

As strategic analysis and communications director, Watkins will lead the organization that enables the center to make sound business decisions, and accurately and consistently inform stakeholders about the present and future missions of NASA. The organization employs numerous internal and external communications conduits to communicate the center's goals and successes to the Marshall work force, NASA leadership, and Marshall's partners, customers and stakeholders.



Dan Schumacher



Bobby Watkins

The office also provides centerwide independent technical, schedule, management, and resource evaluations and estimates of the center's programs, projects and mission support activities. The analyses and resulting policy and resource recommendations serve to facilitate critical executive management decisions and communicate and characterize the center's programmatic and institutional alignment, health and performance.

After receiving a bachelor's degree in mathematics from Albany State University in Albany, Ga., in 1986, Watkins joined NASA. He assisted with the implementation of the Digital Voice Intercom System for the Mission Control Center, later managing IT systems and resources for Johnson's Office of Space Flight and the Space Shuttle Program Office. Since then, he has served in a number of leadership and technical positions at both Johnson and Headquarters. In 1995, Watkins was selected for the NASA Professional Development Program. During this six-month assignment, he served as a legislative fellow for a member of Congress from Texas. In this role, Watkins led, managed and drafted a U.S. House Resolution that would allow for a balanced NASA budget during a time of major budget cuts throughout NASA and the federal government. This effort included coordinating with the NASA Administrator's Office and Headquarters' Legislative Affairs, as well as soliciting support from other members of Congress and negotiating with congressional staffers of the Science Committee for support of the balanced budget approach for NASA.

As assistant associate administrator of the Exploration Systems Mission Directorate at Headquarters, Watkins served as the principal advisor to the associate administrator for Directorate Policy and Management, and facilitated programmatic and business management decisions. As chief engineer at Johnson, he established, maintained and had direct oversight of Johnson engineering policies, standards and practices, and oversaw implementation of NASA-wide program and project management policies, standards and practices. As Johnson's chief of staff, he is responsible for the technical and business integration activities on behalf of the Office of the Director, which includes center operations support for IT, financial, personnel and other areas of operations for Johnson that support the space shuttle, International Space Station and Constellation programs.

# Science & Mission Systems Office celebrates outstanding team members

By Dauna Coulter

The Marshall Space Flight Center's Science & Mission Systems Office honored its outstanding team members at the organization's annual awards ceremony in June. More than 175 Hawaiian shirt-clad attendees received colorful leis as they gathered in Activities Building 4316.

"The most prestigious award within our organization is to be recognized by your peers for your exceptional contributions," said Dr. Raymond "Corky" Clinton, Science & Mission Systems acting manager, welcoming event participants. "That's why we gather each year and why we gather here today – to recognize those of you who have gone the extra mile, pulled out all the stops and shown outstanding professionalism in everything you do."

Before awards were presented, team members participated in several "Survivor"-themed games. After the meal, managers presented the 2010 Group Achievement and Peer Awards and some Certificates of Appreciation.

Group Achievement Award recipients included the following teams:

- National Space Science and Technology Center Management Team
- Chandra Momentum Unloading Propulsion System Anomaly Response Team
- James Webb Space Telescope Mirror Support Team
- Hinode End of Prime Mission Review Team
- Lunar Quest Program Formulation Team
- Cold Gas Test Article Team
- MSFC Constellation Program Office Team
- Fission Surface Power Team
- Material Science Research Rack Team
- Short-term Prediction Research and Transition Project Team
- Hurricane Imaging Radiometer Science and Engineering Team
- All Clear Space Weather Model Team
- Solar Experimental Physics Team
- Solar Probe+ Proposal Team
- Flight Readiness Team for the High-Energy Replicated Optics, or HERO, Suborbital Balloon Experiment Team
- Chandra/SZ Experimental Cosmology Research Project Team
- Regional Visualization and Monitoring System, or SERVIR, Team
- Advanced Thin Ionization Calorimeter Team



S&MS Peer Award winners, from left, are Carrie Sloan Rice, Karthik Srinivasan, Brian Mulac, Patrick O'Leary, Sanae Kubota, Linda Yarbrough, Tammy Fullington, Teresa Fuson, Tonya Archer, Ernie Wright, Gary Jedlovec, Ken Aschenbrenner, David Chaffee and Alicia Moncrief.

- Gamma Ray Burst Monitor Team

Certificates of Appreciation were given to the following people: Gwen Artis of GDR Consultants, Clark Darty, Bonnie James, Andrew Keys and Terri Tramel.

Nominated by their fellow team members, Star Performer Peer Award winners excelled in the categories of Communication, Teamwork, Excellence, Innovation and Above-and-Beyond service. A civil servant and a contractor were honored in each category – there were some ties – as follows:

- Sanae Kubota of Johns Hopkins University Applied Physics Laboratory, and Ernie Wright, Communication Award
- Ken Aschenbrenner of Gray Research, Inc., Tammy Fullington of Dynetics Inc., Gary Jedlovec and Linda Yarbrough, Teamwork Award
- Teresa Fuson of Dynetics Inc., Karthik Srinivasan of University Space Research Association, and David Chaffee, Excellence Award
- Alicia Moncrief of Digital Fusion Solutions Inc., Patrick O'Leary of SAIC, and William Koshak, Innovation Award
- Carrie Sloan of Schafer Corp., Tonya Archer and Brian Mulac, Above-and-Beyond Service Award

"It is so encouraging to come to work and be reminded every day of just how tremendous our S&MS team is – dedicated, hard working, fun," Clinton said in closing. "We have a fantastic group of people on our team, and I am tremendously privileged to work with each of you. Thanks to all of you who constantly make working in S&MS so rewarding."

*Coulter, a Schafer Corporation employee, supports the Office of Strategic Analysis and Communications.*

## Obituaries

**Jerry Drake Weller**, 70, of Huntsville died June 26. He retired from the Marshall Center in 1998 as an aerospace engineer supervisor. He is survived by his wife, Diane Braden Weller.

**Roy Shaw**, 76, of Maggie Valley, N.C., died June 27. He retired from the Marshall Center in 1992 as an aerospace engineer. He is survived by his wife, Maureen Calkins Shaw.



# Marshall team invited to ice cream party July 20; bring canned goods for 'Feds Feed Families' food drive

Marshall Space Flight Center team members are invited to an ice cream party from 11 a.m. to noon July 20 in the Building 4203 lobby.

Everyone is encouraged to bring canned goods to the event for the "Feds Feed Families" food drive. Marshall's goal is to collect 6,350 pounds of food

for needy families.

For more information, contact Cindy Spidel at 544-0144.



## Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Marshall Star Ad Form." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, July 22, is 4:30 p.m. Thursday, July 15.

### Miscellaneous

Bowflex XTL with attachments, manual, video, \$375. 256-880-7305

Dumbbell set, solid hex, 45 pounds each, cast iron, gray enamel finish. 256-348-4139

Redstone Lanes 50/50 Card, \$25. 256-479-8839

China, eight place settings, platter, bowl, sugar, creamer, calla lily pattern, photo available, \$500. 256-653-4835

285/75/17r Nitto Terra Grapplers, set of 4, \$575; four black H2 wheels, \$275 obo. 256-599-1277

Tickets for Bristol Sprint Cup Night Race, eight seats together, face value, \$109 each. 256-679-2165

Cavalier King Charles Spaniel, 6 weeks old, one male, one female, tri-color, \$750. 256-497-8693

Playstation 3 game, Little BIG Planet, Game of the Year edition, rated E, \$30. 256-828-1234

Yamaha Advantage Alto-Sax YAS-200AD. 256-738-8048

Cosco High Back Booster Car Seat, black, \$25. 256-682-6325

Truck camper shell, \$65; beige wingback chair, \$30; four 14-inch tires, \$20. 256-852-6952

### Vehicles

2010 Toyota Camry, four cylinder, pictures, Carfax available, 3,772 miles, \$17,975. 256-651-8507

2009 Yamaha Rhino Limited Side X Side, red, winch, extended warranty, \$10,495. 256-508-5515

2007 Honda cbr1000rr, title in hand, 3,700 miles, \$6,800 obo. 205-807-7841

2006 Toyota Tundra double cab, black, tan interior, bed cover, 52k miles, \$17,000. 256- 837-8389

2004 SAAB, leather, CD, new tires, sell for pay off of

approximately \$10,400. 256-683-3932

1998 Stingray RS180 Bowrider, seats seven, bimini

covers, fish/ski, new 140 I/O, \$9,500. 256-640-6427

1994 Toyota pickup 4x4, V6, new tires. 256-426-4539

1989 Dodge Grand Caravan, auto/air, white/blue, 146k miles, \$1,700. 227-0339

### Free

Moving boxes, pick-up only. 256-651-7640

### Wanted

All types of brick/masonry work, licensed/insured brick mason. 256-698-8232

Brown Lab puppy. 256-682-6325

### Lost

LG cell phone, June 10. 544-6066

## Shuttle Buddies to meet July 26

The Shuttle Buddies will meet at 8:30 a.m. July 26 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.

booster recovery ship, waited to tow the tank to Kennedy.

Political representatives and many NASA officials, including Marshall Space Flight Center Director Robert Lightfoot, attended the event. ET-138 served as a backdrop for speakers during a ceremony that preceded the rollout.

"Sitting behind us, ET-138 is the best example of the pride and dedication of the workforce here at Michoud," Lightfoot said.

"The work force here is the backbone of the Space Shuttle Program," said Bill Hill, assistant associate administrator of the Space Shuttle Program. "We asked you to finish strong and you have done that. Thank you."

ET-138 is scheduled to fly on the last space shuttle mission, STS-134, targeted to launch Feb. 26, 2011. The commander of that mission, NASA astronaut Mark Kelly, also was on

hand to praise Michoud workers and their craftsmanship.

Lockheed Martin is completing work on ET-122, which was damaged during Hurricane Katrina five years ago. ET-122 is a launch-on-need tank and could be used in the unlikely event a rescue mission is needed during the STS-134 mission. It is being refurbished at Michoud and will be shipped to Kennedy in late September.

Lockheed Martin Space Systems Company of Denver was awarded a contract in 1973 to build the external tanks. Lockheed Martin workers at Michoud have built and delivered 134 flight tanks to NASA's Space Shuttle Program.

During a launch, the external tank delivers 535,000 gallons of hydrogen and oxygen liquid propellants to the three main engines, which power the shuttle to orbit. The tank is covered by polyurethane-like foam, with an average thickness of

about one inch. The foam insulates the propellants; keeps ice from forming on the tank's exterior; and protects its aluminum skin from aerodynamic heat during flight.

The external tank is the largest element of the space shuttle, which also includes the orbiter, main engines and twin solid rocket boosters. It measures 27.6 feet wide and 154 feet tall. Despite the tank's size, its aluminum skin is only one-eighth-inch thick in most areas. Yet it withstands more than 7.5 million pounds of thrust during liftoff and ascent. The tank is the only major shuttle component that is not reused.

*Martel, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.*



A New Orleans brass band helps celebrate ET-138's completion.

## Marshall Career Transition Center moves to Education Training Facility

The Marshall Career Transition Center moved from Building 4200, Room G13, to the Education Training Facility at the U.S. Space & Rocket Center on July 13.

The transition center, opened to all team members,

provides information about job opportunities and employment services such as virtual and on-site job fairs, and workshops. It works to ensure all team members are informed and prepared for a successful transition.

Workshops, covering topics such as resume writing and interviewing skills, are held from 9 a.m. to 2 p.m. on Tuesdays, and by appointment on Thursdays.

For more information about the transition center and workshop topics, visit Inside Marshall, <http://transition.msfc.nasa.gov/index.html>, or contact Julia Seal at 544-3106.

## Engine *Continued from page 1*

The Marshall Space Flight Center is responsible for providing propulsion engineering oversight during testing of the CECE and has managed the throttling cryogenic engine technology development.

"An outstanding team of NASA and Pratt & Whitney Rocketdyne engineers worked diligently to get us to this milestone," said Tony Kim, Deep Throttling Engine Technology Development manager at the Marshall Center. "I couldn't be more pleased with the test results we achieved. Our collaborative teaming environment allowed our members to stretch the boundaries of engine operations."

Another key objective of this test series and a successful first for this type of rocket engine was to test a closed-loop control system using a fuel mixture ratio component that controls the amount of liquid oxygen and liquid hydrogen entering the combustion chamber. This system also monitors the combustion chamber pressure feedback during throttling. Precise control of propellant and thrust will reduce the amount of fuel needed to land future space vehicles, reducing launch cost and weight, and opening more payload capability.

Landing a space vehicle at an unknown location can be compared to driving at night where unforeseen challenges present themselves and drivers have to be able to react quickly and accurately to avoid a collision. The same is true for a spacecraft when they come upon a rock or boulder before landing. The spacecraft has to be able to throttle up quickly and accurately to avoid damaging the craft. The CECE team has worked to increase the engine's ability to throttle quickly and precisely decreasing the risks associated with landing humans and expensive space hardware.

"NASA will benefit from the advancements made to this technology, and I'm confident that the cosmos will be opened and available to humanity, in no small part, because of these achievements," said Frank Peri, director of the Exploration Technology Development Program at NASA's Langley Research Center in Hampton, Va.

The total test time for the technology demonstration 1.7 test series was 2,403 seconds. When combined with the previous three test series, that brings the program's total engine test time to 7,436 seconds, or 124 minutes, providing a large amount of test data to quantify CECE performance and capability. All of the tests were conducted at a NASA-owned Pratt & Whitney Rocketdyne-operated facility in West Palm Beach, Fla.

The CECE is based on the existing Pratt & Whitney Rocketdyne RL10 upper stage rocket engine. The previous RL10 track record as well as the recent technology demonstrations provides confidence and buys down risk for a possible future throttling engine

development to support space exploration. The test data will allow engineers to develop simulation models to help predict engine behavior based on design parameters.

The CECE collaboration includes engineers from Marshall, NASA's Glenn Research Center in Cleveland, and Pratt & Whitney Rocketdyne. NASA has invested in CECE technology since 2005 as part of the Propulsion and Cryogenics Advanced Development project at Glenn. The project is funded by the Exploration Technology Development Program in NASA's Exploration Systems Mission Directorate.

*Newton is a public affairs officer in the Office of Strategic Analysis & Communications.*



Testing of the Common Extensible Cryogenic Engine, also known as CECE, at 100 percent power level.

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